

East of Emerald Projects

Environmental Assessment Checklist



**Clearwater Unit
Southwest Land Office
Montana Department of Natural Resources and Conservation
April 2022**



East of Emerald Projects

Environmental Assessment Checklist



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Environmental Assessment Checklist

Project Name: East of Emerald Projects

Proposed Implementation Date: June 2022

Proponent: Clearwater Unit, Southwest Land Office, Montana DNRC

County: Missoula

Type and Purpose of Action

Description of Proposed Action:

The Clearwater Unit of the Montana Department of Natural Resources and Conservation (DNRC) is proposing the East of Emerald Projects. The project is located approximately 5½ air miles southeast of the town of Seeley Lake (refer to Attachments vicinity map A-1 and project maps A-2 through A-4) and includes the following sections:

Beneficiary	Legal Description	Total Acres	Treated Acres
Common Schools			
Public Buildings			
MSU 2 nd Grant			
MSU Morrill			
Eastern College-MSU/Western College-U of M			
Montana Tech			
University of Montana			
School for the Deaf and Blind			
Pine Hills School	Sec 28 & 34 T16N R14W	760	612
Veterans Home			
Public Land Trust			
Acquired Land			

Objectives of the project include:

- Contribute to the DNRC's annual target of timber harvest volume (sustained yield) as mandated by state law (77-5-221, MCA).
- Generate revenue for the trust beneficiary (Pine Hills School).
- Salvage the value of Douglas-fir sawtimber recently lost to Douglas-fir bark beetle (*Dendroctonus pseudotsugae*) and remove all brood trees before the beetles' next flight to reduce the chances of greater mortality in neighboring Douglas-fir stands.
- Minimize the risk of devastating wildfire by reducing fuel loading and stand density through silvicultural treatments and pre-commercial thinning.
- Return stands to their Desired Future Condition (ARM 36.11.405) using silvicultural treatments, site-prep and planting.
- Improve forest road infrastructure for future management.

Proposed activities include:

Action	Quantity
Proposed Harvest Activities	# Acres
Individual Tree Selection (regeneration)	357
Individual Tree Selection (improvement)	73
Insect Salvage	84
Total Treatment Acres	514
Proposed Forest Improvement Treatment	# Acres
Pre-commercial Thinning	612
Site Prep	49
Planting	71
Proposed Road Activities	# Miles
Road maintenance	7.53
New permanent road construction	0.80
New temporary road construction	0.29
Road abandoned	0.14

Duration of Activities:	5 years
Implementation Period:	June 2022 – March 2027

The lands involved in this proposed project are held in trust by the State of Montana. (Enabling Act of February 22, 1889; 1972 Montana Constitution, Article X, Section 11). The Board of Land Commissioners and the DNRC are required by law to administer these trust lands to produce the largest measure of reasonable and legitimate return over the long run for the beneficiary institutions (Section 77-1-202, MCA).

The DNRC would manage lands involved in this project in accordance with:

- The State Forest Land Management Plan (DNRC 1996),
- Administrative Rules for Forest Management (ARM 36.11.401 through 471),
- The Montana DNRC Forested State Trust Lands Habitat Conservation Plan (HCP) (DNRC 2010)
- Blackfoot Clearwater Conservation Easement (DNRC 2004)
- and all other applicable state and federal laws.

Project Development

SCOPING:

- DATE:
 - December 2021 / January 2022
- PUBLIC SCOPED:
 - The scoping notice was posted on the DNRC Website: <http://dnrc.mt.gov/public-interest/public-notices>
 - The Initial Proposal with maps was sent to 76 individuals, agencies, and other organizations that have expressed interest in DNRC's management activities.
 - The Initial Proposal was published in two issues of the Seeley Lake Pathfinder (December 16 and 23, 2021)
- AGENCIES SCOPED:
 - Montana Department of Fish, Wildlife and Parks (FWP)
 - United States Forest Service, Seeley Lake Ranger District
 - Montana Tribal Nations
- COMMENTS RECEIVED:

DNRC received 6 comments

 - **Big Sky Lake Homeowners Association (BSL HOA)**
 - Concerns: Use of the private road system around Big Sky Lake; designation of the private roads on the map; labeling of Big Sky Lake on the map; clearcutting and visibility of the harvest from the lake; weed management
 - Results: the concerns were addressed as follows
 - The private road system will not be used for hauling and the final map was updated with proper designation of the private road system around Big Sky Lake.
 - "Fish Lake" was changed to "Big Sky Lake" on the map after BSL HOA provided proof of the official name change by the United States Board on Geographic Names in 1999.
 - Clearcutting is not proposed for harvest. BSL HOA was informed the DNRC would prepare units visible from Big Sky Lake in such a way as to address aesthetic concerns.
 - Weed spraying and grass seeding will be required by the purchaser as part of the timber sale.
 - **Weyerhaeuser and F.H. Stoltze Land & Lumber Company**
 - The mills were generally supportive of the project. F.H. Stoltze suggested DNRC consider alternative ways to handle pulp products to increase options for purchasers.
 - **Blackfeet Nation and Northern Cheyenne Tribes**
 - Concerns: Northern Cheyenne requested a Class 1 review of the area. Blackfeet Nation requested that they be notified if anything of interest is found on the project site.
 - Results: Referred to DNRC Archaeologist, Patrick Rennie.
 - **Unnamed adjacent landowner**
 - Concerns: Concern for safety and need for improvements on the private road system around Big Sky Lake if it is used.
 - Results: This road system will not be used for hauling.

DNRC interdisciplinary team:

- Project Leader: **Melissa Laskos**
- Archeologist: **Patrick Rennie**
- Wildlife Biologist: **Garrett Schairer**
- Hydrologist & Soil Scientist: **Andrea Stanley**
- Fisheries Biologist: **Mike Anderson**
- MEPA Planner: **Emilia Grzesik**

Internal and external issues and concerns were incorporated into project planning and design and will be implemented in associated contracts.

**All comments received are within the sale file and can be located at the Clearwater Unit Office.*

OTHER GOVERNMENTAL AGENCIES WITH JURISDICTION, LIST OF PERMITS NEEDED: *(Conservation Easements, Army Corps of Engineers, road use permits, etc.)*

- **United States Fish & Wildlife Service-** DNRC is managing the habitats of threatened and endangered species on this project by implementing the Montana DNRC Forested Trust Lands HCP and the associated Incidental Take Permit that was issued by the United States Fish & Wildlife Service (USFWS) in February of 2012 under Section 10 of the Endangered Species Act. The HCP identifies specific conservation strategies for managing the habitats of grizzly bear, Canada lynx, and three fish species: bull trout, westslope cutthroat trout, and Columbia redband trout. This project complies with the HCP. The HCP can be found at <http://dnrc.mt.gov/divisions/trust/forest-management/hcp>.
- **Montana Department of Environmental Quality (DEQ)-** DNRC is classified as a major open burner by DEQ and is issued a permit from DEQ to conduct burning activities on state lands managed by DNRC. As a major open-burning permit holder, DNRC agrees to comply with the limitations and conditions of the permit.

A Short-term Exemption from Montana's Surface Water Quality Standards (318 Authorization) may also be required from DEQ if activities such as replacing a bridge on a stream would introduce sediment above natural levels into streams.

- **Montana/Idaho Airshed Group-** The DNRC is a member of the Montana/Idaho Airshed Group which was formed to minimize or prevent smoke impacts while using fire to accomplish land management objectives and/or fuel hazard reduction (Montana/Idaho Airshed Group 2010). As a member, DNRC must submit a list of planned burns to the Airshed Group's Smoke Monitoring Unit describing the type of burn to be conducted, the size of the burn in acres, the estimated fuel loading in tons/acre, and the location and elevation of each burn site. The Smoke Monitoring Unit provides timely restriction messages by airshed. DNRC is required to abide by those restrictions and burn only when granted approval by the Smoke Monitoring Unit when forecasted conditions are conducive to good smoke dispersion.

ALTERNATIVES CONSIDERED:

No-Action Alternative:

- No forest management activities would occur
- No revenue would be generated for the Pine Hills School trust at this time
- Douglas-fir bark beetle would continue to spread to adjacent stands
- Overstocked stand conditions would not be treated
- Associated fire conditions and fuel hazards would continue within this Wildland Urban Interface (WUI) area
- Shade-tolerant species would continue to out-compete seral species, removing stands from their historic cover type and species distribution and away from the Desired Future Condition (DFC) (ARM 36.11.405) in most stands
- Other uses such as recreation, fire suppression, requests for permits and ongoing management requests may still occur

Action Alternative:

- Forest management would occur, including commercial timber harvest, pre-commercial thinning, site-prep and planting
- Revenue would be generated for the Pine Hills School trust
- Commercial harvest of 514 acres would produce an estimated two million board feet of volume to contribute to the DNRC's sustained yield, as mandated by state statute 77-5-222
- Stand stocking levels would be reduced and could show a decrease in losses by insect and disease
- Fuel conditions would be improved and risk of fire spread on DNRC lands would be decreased
- A mix of even-aged and intermediate forest management strategies would be applied across the harvested units to promote DNRC's Desired Future Condition
- Weed management, road maintenance and road construction would occur
- Other uses such as recreation, fire suppression, requests for permits and ongoing management requests may still occur

Impacts on the Physical Environment

Evaluation of the impacts on the No-Action and Action Alternatives including **direct, secondary, and cumulative** impacts on the Physical Environment.

VEGETATION:

Stand History/Past Management

Prior to the arrival of European settlers in the 1800s, fire was the primary disturbance agent on these lands. The bulk of human disturbance on the forest began in the 1880's with the arrival of the Northern Pacific Railroad. Remnants of old railroad grades used for logging can be found within the project area. Timber immediately adjacent to the right-of-way was heavily cut for use in the construction of the railroad and for export to outside markets. By the 1890's, most of the accessible timber in the Blackfoot and Bitterroot valleys had been cut and by the 1930's, nearly 22% of the entire climatic section M332B (explained below in Vegetation Existing Conditions) had been logged (Losensky, 1997).

The north half of Section 34 and most of section 28 has been owned by the State since 1894. Several DNRC timber sales have occurred on the parcels proposed for treatment under this assessment. Our records show harvest treatments dating back to 1939 with the most recent activity occurring in 2018. In addition, many bales of Christmas trees were frequently harvested from these parcels in the 1940's, 50's and 60's.

Issues and Concerns: *The following issue statements were developed during scoping regarding the effects of the proposed action to vegetation.*

- The present timber stand species mixes do not meet the Desired Future Condition (DFC)
- Shade tolerant species would continue to out-compete seral species, removing stands from their historic cover type and species distribution
- Tree mortality from insects and disease is above acceptable levels
- Young stands are currently overstocked
- Forest fuel loadings are at moderate to high levels, increasing risk of intense wildfire
- Forest management activities may adversely affect Old Growth stands
- Timber harvest and road building may result in introduction of new weeds or increased spread of noxious weeds
- There is a concern proposed project activities could negatively impact populations of threatened, endangered, or sensitive plant species

Vegetation Existing Conditions:

Standard Vegetative Community:

At a larger scale, this area falls within the Bitterroot-Blackfoot climatic section M332B, which was historically 79% forested (Losensky, 1997). The project area ranges in elevation from 4,200

to 5,300 feet. These areas were historically dominated by young (less than 40 years) lodgepole pine stands and middle-aged Douglas-fir stands with mature Ponderosa pine stands dominating the lower slopes and valleys (Losensky, 1997). Western larch/Douglas-fir stands occupied about 4% of the climatic section. Past harvest treatments were not necessarily done with the same ideals that we use today. As a result, some stands have regenerated to a different species than what would be historically expected. Now, compared to the Desired Future Condition, Douglas-fir and other cover types are over-represented while ponderosa pine stands are vastly under-represented. See table V-1 below.

Table V-1 – Current and appropriate cover type for the East of Emerald Project Area.

Cover Type	Current Acres	Current Percent of Project Area	Desired Future Condition (DFC)	
			Acres	Percent
Douglas-fir	244	32%	-	0%
Lodgepole pine	40	5%	-	0%
Mixed conifer	14	2%	-	0%
Ponderosa pine	212	28%	695	91%
Western larch	18	2%	-	0%
Western larch/Douglas-fir	232	31%	65	9%
Total:	760	100%	760	100%

The current species makeup of the proposed harvest units is composed primarily of Douglas-fir, ponderosa pine and western larch with some interspersed lodgepole pine. This is very typical of the flatter and south-facing slopes in section 28. The north-facing slopes of section 34, south of Woodworth Road, are primarily western larch/Douglas-fir type, but the occasional large ponderosa pine tree can be found on the flatter benches of the hillside. The stand structures found in the project area are multi-storied with reduced numbers of seral species and large trees—mainly a result of past harvesting. Most of the project area is in the sawtimber size class and has a moderate stocking overall with naturally clumpy spacing. There is also a moderate sapling and pole size class throughout the understory. The understory has a high component of Douglas-fir, but ponderosa pine, western larch and lodgepole pine are also well-represented. The flats in section 34 are abundantly stocked with natural lodgepole pine regeneration as well as some ponderosa pine that was planted previously.

Fire Hazard/Fuels

Fire hazard in the project area is moderate to high. Overstocking of sawtimber in combination with ladder fuels in the lower canopy levels—such as pole-size and younger regeneration—may promote intense crown fires if wildfire were to occur here. The project area is bordered by private property which puts it in the Wildland Urban Interface (WUI). Lack of vegetative management on adjacent public lands heightens the risk of wildfires spreading, however there has been recent wildfire mitigation efforts on the neighboring private lands. If we proceed with the action alternative our adjacent management may help discourage devastating wildfires.

Insects and Diseases

Douglas-fir bark beetle is significantly impacting the stand of timber south of Woodworth Road in section 34. Small pockets of bark beetle were also found throughout the harvest units in section 28. While spruce budworm is present in the project area, it is not a significant threat at this time. There is a presence of dwarf mistletoe in the lodgepole pine, western larch and Douglas-fir, but it is not a widespread issue and would be addressed in the action alternative. There appears to be some root rot pockets in section 28 as well. Promoting seral species in these pockets will help slow the spread of root rot.

Sensitive/Rare Plants

The Montana Natural Heritage Program (MNHP) has identified four rare vascular plants that are known to exist within the general proximity of the project area. None of the plants were discovered in the project area, however the following plant species may exist there based on data from MNHP.

- **Howell's Gumweed** (*Grindelia howellii*)
- **Beck Water-Marigold** (*Bidens beckii*)
- **Pygmy Water-lily** (*Nymphaea leibergii*)
- **Slender Cottongrass** (*Eriophorum gracile*)

Most of these plants prefer wet sites and would typically occur in protected riparian areas. However, Howell's Gumweed may also occur in disturbed areas such as roadsides. The MNHP website states:

Most populations are small and many occur on roadsides or other similarly disturbed habitat. This habitat preference in conjunction with the short-lived nature of the species means occurrences may drift from place to place or from year to year and as a result many occurrences may be ephemeral. These attributes make determination of population numbers as well as the number of extant populations at any given time difficult to assess. Invasive weeds are a threat to many occurrences, as the habitat occupied by G. howellii is also favorable for many weedy species. Application of herbicides to control these weeds, especially along roadsides may also have a direct, negative impact.

Noxious Weeds

Noxious weeds occurring in the project area consist mainly of spotted knapweed (*Centaurea maculosa*), houndstongue (*Cynoglossum officinale* L) and Canada thistle (*Cirsium arvense*).

Knapweed is extensive throughout the area, primarily along roads, old log landings and the drier forested portions of the project area. Moist sites with well-established surface vegetation provide a competitive advantage over noxious weed establishment. Reseeding of roadcuts followed by roadside spot herbicide treatments has been used on noxious weeds on portions of the project area. This has helped reduced the spread of noxious weeds.

Introduction and continual spread of noxious weeds comes from past timber harvest activities and hauling, soil disturbance from fire, recreational use such as horseback riding, wildlife grazing and off-road vehicles carrying seed along roads, old skid trails and new illegal off-road trails.

Environmental Effects:

No-Action Alternative – Direct, Indirect, and Cumulative Effects:

The No-Action alternative would not change the current existing conditions within the proposed project area. The proposed management activities—including commercial harvest, pre-commercial harvest, site-prep, planting, weed management, road maintenance and road construction—would not occur. These stands would remain at overstocked levels and at greater susceptibility to insects and disease. The Douglas-fir bark beetle (*Dendroctonus pseudotsugae*) outbreak in these stands would continue to spread. Concerns regarding overstocked stands and fire danger in the Wildland Urban Interface (WUI) would continue and fuel conditions would not be improved in this area. All pre-commercial stands would continue to grow with decreased vigor and would show increased mortality. As a result, there would be low to moderate risk of direct, indirect, and cumulative impacts to the vegetative community under the No-Action alternative.

Action Alternative – Direct, Indirect, and Cumulative Effects:

This proposal includes commercial timber harvest under two sales on approximately 514 acres removing an estimated two million board feet. Pre-commercial thinning would also occur under this assessment on a proposed 612 acres. The DNRC would try to address the concerns within the Existing Conditions on these acres by using various treatment types. Treatment type would vary based on stand conditions and would include the following management strategies:

Individual Tree Selection (regeneration): These units are currently stocked with moderate advanced regeneration and small sawtimber beneath a moderate overstory of larger, older trees. Units under the shelterwood treatment would leave quality dominant overstory trees (favoring the DFC species) to provide a seed source to establish the next cohort. Spacing of residual trees would vary based on stand health and vigor, but individuals or small groups (2-5 trees) would be spaced within the range of 35 to 75 feet apart. Quality small sawtimber would be spaced out in the mid-level canopy in order to maintain stands of timber that could be re-entered in presumably 20 years, continuing to provide revenue to the Trust beneficiary in the interim while progressing slowly towards the Desired Future Condition. Following harvest, pre-commercial thinning would occur in these stands.

Individual Tree Selection (improvement): These units contain many trees that exhibit poor phenotypical characteristics (forks, crooks, flat tops, poor growth, disease, etc.). The goal would be to remove bad genetics from the population and remove trees that are growing poorly. Quality overstory trees would remain to provide shade and a seed source. Residual spacing and stocking levels would vary across the units and would be dependent upon stand health and vigor. Clumps of healthy regeneration would remain. Following harvest, site prep would occur to prepare the ground for natural regeneration, however planting may be required on these sites.

Insect Salvage: This unit contains an active Douglas-fir bark beetle infestation, so the primary goals here would be to:

1. salvage trees that were recently killed by beetle
2. remove brood trees to prevent further spread of the beetle, and
3. thin the stand to approximately 60ft² basal area per acre which will reduce the likelihood of beetles continuing to attack the stand.

Seral species would be favored, but Douglas-fir would still be well-represented since western larch/Douglas-fir type is the DFC for about half of this unit. Residual spacing would vary based on stand health and vigor. Grouping of residual trees (small groups of 2-5 trees) would be encouraged. On average, individual trees would be spaced at 25 feet, but small groups of trees may be spaced slightly farther apart, up to 55 feet. Following harvest, pre-commercial thinning would occur in this unit. Planting may also be necessary if the salvage portions of the unit are extensive.

Pre-Commercial Thinning:

Pre-commercial thinning is defined as removing small trees not for monetary benefit but to reduce stand stocking, release limited resources (water, light and nutrients) and improve growth of residual trees. It has also proven to decrease the loss of deterioration through mortality and poor growth over a longer time-period, especially on poor sites. Smaller trees (less than 6" diameter at breast height) are the target of this silvicultural prescription. This treatment often follows commercial harvest treatment when quality regeneration is present. Typical spacing for pre-commercial thinning in this area ranges between 10 and 15 feet between trees (436 to 194 trees per acre). Fuels treatment after the thinning would be done using either limbing and slashing of felled trees to a level less than 18" from the ground level or hand piling and burning.

Planting:

Tree planting could occur on up to 71 acres under this proposal. The areas targeted for planting are sites that either:

1. have not established suitable regeneration following past harvests
2. are regenerating to Douglas-fir rather than the appropriate DFC species, or
3. have limiting qualities that make natural regeneration difficult to establish, such as pine grass (*Calamagrostis rubescens*)

Site-prep (i.e. dispersed skidding, unit pile burning, dozer scarification, etc.) may also occur ahead of planting to encourage the best possible results.

Road Construction, Maintenance and Closure:

This proposal plans to use existing road systems within the project area for various forest management purposes. Road abandonment is proposed on a road that was illegally established, is in a poor location without drainage and is not necessary for future management. Another segment of new construction is proposed that will reduce skid distances over uneven terrain for mechanical logging as well as allow us to line-log a 16-acre piece of ground that is being attacked by bark beetle. The new construction will be gated and closed to public use.

The proposed action would be expected to result in low direct, indirect and cumulative impacts on forest vegetation beyond those projected for the No-Action alternative.

Recommended Mitigation Measures for Vegetation: *The analysis and levels of effects to vegetation resources are based on implementation of the following mitigation measures.*

- Favor ponderosa pine and western larch in harvest units and pre-commercial thinnings to shift species represented toward the accepted Desired Future Condition (DFC).

- Plant ponderosa pine and western larch in planting units where natural regeneration is difficult to achieve. This will also ensure the establishment of the accepted DFC species for that unit.
- Harvest prescriptions would emulate natural disturbance historically present on the landscape.
- Healthy, vigorous advanced regeneration exhibiting good form would be protected during harvest activities.
- Logging equipment would be washed before entering the sale area to limit noxious weed introduction.
- Grass seed would be planted on newly disturbed road surfaces to expedite grass establishment, thereby limiting the resources available for weeds to become established.
- Herbicide would be applied to spot infestations of weeds along roadways and landings, but spraying would be avoided within any Howell's gumweed populations.
- Slash produced during harvest would be piled and burned post-harvest to reduce fuel loading. In addition, any slash that remains in the woods would be scattered, limbed and slashed to a depth of no more than 18 inches.
- Snags, snag recruits and coarse woody debris will be managed according to ARM 36.11.411 through 36.11.414. Clumps of existing snags could be maintained where they exist to offset areas without sufficient snag presence. Coarse woody debris retention would emphasize retention of downed logs 15-inches diameter and larger.

Vegetation	Impact												Can Impact Be Mitigated?	Comment Number
	Direct				Secondary				Cumulative					
	No	Low	Mod	High	No	Low	Mod	High	No	Low	Mod	High		
No-Action														
Current Cover/DFCs		X			X				X					
Age Class	X				X				X					
Old Growth	X				X				X					
Fire/Fuels		X				X				X				
Insects/Disease			X				X			X			Y	V-1
Rare Plants	X				X				X					
Noxious Weeds		X				X			X					
Action														
Current Cover/DFCs		X			X				X					V-2
Age Class		X			X				X					
Old Growth		X			X				X					V-3
Fire/Fuels		X				X				X			Y	V-4
Insects/Disease		X				X				X				V-1
Rare Plants		X			X				X					
Noxious Weeds		X				X			X				Y	V-4

Comments:

V-1: To reduce the spread of Douglas-fir bark beetle it is necessary to remove brood trees prior to the beetles emerging and flying to new susceptible trees each spring/summer (approximately May-July). Given the severity of the current beetle outbreak in section 34, the no-action alternative would allow the beetles to spread and impact vast tracts of land. The action alternative would remove brood trees in a timely manner to stop or reduce the spread. Some Douglas-fir snags that were killed by beetle could be left as “wildlife trees” providing the insects and larvae are gone from the tree.

V-2: Under the action alternative, silvicultural prescriptions would maintain or promote the Desired Future Condition (DFC). Specifically, 63% of the project area is currently not supporting the DFC (refer to Table V-1 on page 7), so efforts would be made to favor residual trees that are of the accepted DFC species in their corresponding stands. Efforts would also be made to effectively prepare the site for regeneration of seral species (i.e. unit piling, ground scarification, etc.).

V-3: The State’s Stand Level Inventory (SLI) identified 127 acres of the Project Area as “Old Growth” (as defined by Green, et. al.), however field verification showed that those acres do not meet the age criteria for the Old Growth definition and therefore those acres are not Old Growth. These acres still qualify as “Old Growth recruitment stands” though. Recruitment stands have characteristics that make them good candidates to become old growth stands in the future. The SLI identified another 71 acres as recruitment stands which gives a total of 198 acres of recruitment stands present in the Project Area. The action alternative intends to harvest 157 of those 198 acres, but many large old trees would remain.

Large diameter Douglas-fir are especially susceptible to Douglas-fir bark beetle, so it is typically favorable to retain younger trees and/or reduce basal area around healthy large diameter trees as a treatment. The DFC for much of the project area is ponderosa pine type, so the harvest prescriptions would favor large older pine which would likely fall under the Old Growth age class and could produce seeds for natural regeneration.

V-4: Timber harvest would initially produce moderate to heavy slash levels and could introduce or spread noxious weeds, but mitigation measures would be utilized.

Vegetation References:

Green, P., J. Joy, D. Sirucek, W. Hann, A. Zack, and B. Naumann. 1992. Old-growth forest types of the Northern Region. R-1 SES. Unpublished report on file at US Forest Service, Northern Region, Missoula, MT.

Losensky, B. John, Historical Vegetation of Montana. Montana DNRC February 1997. Missoula, MT.

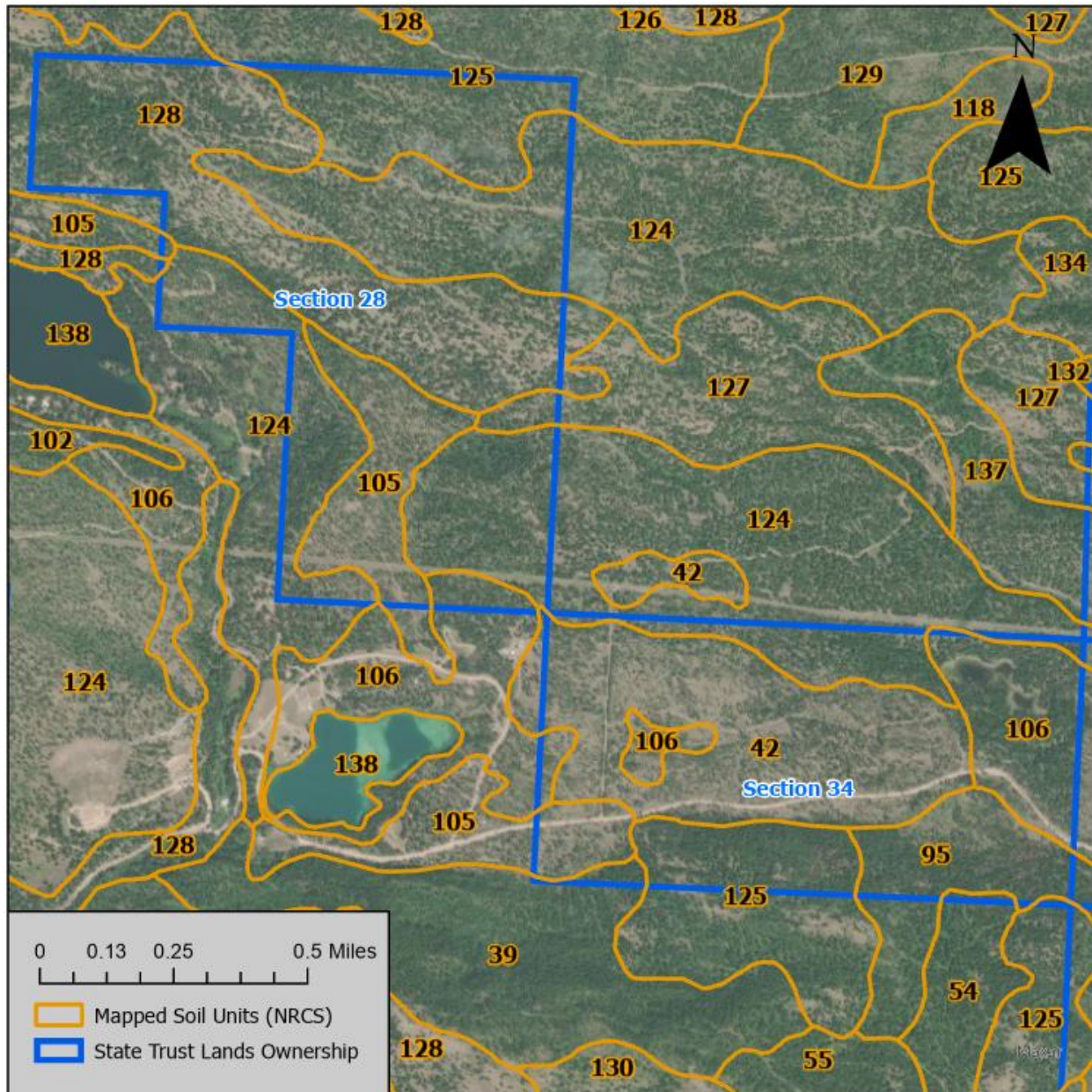
Montana Natural Heritage Program (MTNHP). 2015. Plant species of concern report. Available online at: <http://mtnhp.org/SpeciesOfConcern/?AorP=p>. Last accessed January 3, 2022.

MT DNRC, Environmental Assessments of past DNRC timber sales including: Kozy Korner Projects EA, 2018; Ashes Checklist EA (2013); Sour Fish EIS, 1999; Clearwater Unit, Southwestern Land Office.

SOIL DISTURBANCE AND PRODUCTIVITY:

Soil Disturbance and Productivity Existing Conditions:

The project area is located on mainly south-facing slopes at the southern edge of the Swan Mountain Range. Underlying geology in the northern portion of the sale are Belt Series sedimentary rocks composed mainly of argillites. The southern portion of the sale area located on flat and undulating topography is composed of glacial moraine and outwash. No unstable slopes or unique geologic features area present.



Section 28

Soils within this part of the sale area are a complex of Wildgen, deep cobbly silt loams, on 4-30% slopes (glacial moraines – units 124, 125, and 128) and Totelake very gravelly loams on 2-8% slopes (stream terraces – unit 105).

Proposed harvest units are on slopes 45% or less.

Section 34

Soils within this part of the sale area are complexes Rumblecreek and Wildgen gravelly loams (glacial moraines – units 95 and 125); and Totelake gravelly loam and Glaciercreek gravelly silt loam (outwash plains – units 106 and 42).

Proposed harvest areas are on ground ranging from relatively flat to slopes greater than 45%. A harvest unit with steeper slopes located south of Woodworth Road would be line-logged thereby minimizing soil disturbance risks on steeper harvest areas.

Existing and past disturbances

The project area has the following recorded existing and past disturbances:

Past harvests:

- Sour Fish Timber Sale (2000-2004)
- Tipper's Timber Timber Permit (2009-2010)
- Ashes Timber Permit (2013)
- Tote Road Lake Timber Permit (2017-2018)

The Montana Department of Fish, Wildlife, and Parks hold the grazing licenses in the project area. Lately these licenses have been used to exclude grazing from the area. Consequently, the last inspection completed in summer 2021 by DNRC personnel noted excellent groundcover conditions and no riparian browse.

Soil Disturbance and Productivity	Impact												Can Impact Be Mitigated?	Comment Number
	Direct				Secondary				Cumulative					
	No	Low	Mod	High	No	Low	Mod	High	No	Low	Mod	High		
No-Action														
Physical Disturbance (Compaction and Displacement)	X				X				X				N/A	1
Erosion	X				X				X				N/A	1
Nutrient Cycling	X				X				X				N/A	1
Slope Stability	X				X				X				N/A	1
Soil Productivity	X				X				X				N/A	1
Action														

Soil Disturbance and Productivity	Impact												Can Impact Be Mitigated?	Comment Number
	Direct				Secondary				Cumulative					
	No	Low	Mod	High	No	Low	Mod	High	No	Low	Mod	High		
Physical Disturbance (Compaction and Displacement)		X				X				X			Y	2, 3, 4, 5
Erosion		X				X				X			Y	2, 3, 5
Nutrient Cycling		X				X				X			Y	4, 5, 6
Slope Stability	X				X				X					7
Soil Productivity		X				X				X			Y	4, 5, 6

Comments:

S-1: Implementation of the no-action alternative would result in no new soil resource impacts in the project area. Soil resource conditions would remain similar to those currently at the site.

S-2: Soil and vegetation disturbance from harvest activities may result in temporary increased risk of erosion.

S-3: Soil disturbance and erosion risk increases with slope and slopes in project area exceed 45% in some places. Steeper harvest units are planned for line-logging, thereby minimizing risk.

S-4: Direct impacts by physical disturbance would likely occur by ground-based yarding. The extent of detrimental soil disturbance from ground-based yarding (by compaction and displacement) is expected to be similar to what is reported from monitoring similar past operations (13.2%, DNRC 2011) and would be minimized by use of existing roads and skid trails. Areas that would be line-yarded would have less disturbance (6.2%, DNRC 2011).

S-5: Applicable state plans, rules, and practices have guided project planning and would be implemented during project activities, including the Montana Code Annotated (specifically Title 77, Chapter 5), the Administrative Rules of Montana (specifically Rule Chapter 36.11), the Montana Forest Best Management Practices, and the State Forest Land Management Plan.

S-6: According to Graham et al. (1994), a minimum of 4.5 and up to 9 tons/acre of coarse woody debris (CWD) would be a desired post-harvest condition to maintain forest productivity for this forest habitat type. The action alternative would include increasing or maintaining CWD concentrations per mitigation described below.

S-7: Unstable slopes were not observed on site. The project is anticipated to have no risk to slope stability.

Soil Mitigations:

- BMP's would be implemented on all roads accessing the harvest units and within the units.
- Ground-based logging equipment (tractors, skidders, and mechanical harvesters) would be limited to slopes less than 45% unless not causing excessive disturbance.

- The Contractor and Sale Administrator should agree to a general skidding plan prior to equipment operations. Skid trails would be mitigated following harvesting and yarding operations with water bars and/or slash.
- To prevent soil compaction ground-based mechanical felling and yarding would be restricted to one or more of the following conditions:
 - Soil moisture content at 4-inch depth less than 20% oven-dry weight.
 - Minimum frost depth of 4 inches.
 - Minimum snow depth of 18 inches of loose snow or 12 inches packed snow.
- A minimum of 4.5 tons/acre and up to 9 tons/acre, of coarse and fine woody debris would be maintained on site to meet the concentration for the DF/PHMA habitat type recommended by Graham et al (1994).

Soil References:

DNRC, 2011. DNRC compiled soils monitoring report on timber harvest projects, 2006-2010, 1st Edition. Department of Natural Resources and Conservation, Forest Management Bureau, Missoula, MT.

Graham, R.T., Harvey, A.E., Jorgensen, M.F., Jain, T.B., and Page-Dumrose, D.S., 1994, Managing Course Woody Debris in Forests of the Rocky Mountains. U.S., Forest Service Research Paper INT-RP-477. Intermountain Research Station. 16p.

WATER QUALITY AND QUANTITY:

Water Quality and Quantity Existing Conditions:

The project is located in the Salmon Lake and Cottonwood Creek watersheds. Section 28 is mostly within the Salmon Lake watershed and tributary to the Clearwater River. Section 34 is mostly within the Cottonwood Creek watershed which is tributary to the Blackfoot River.

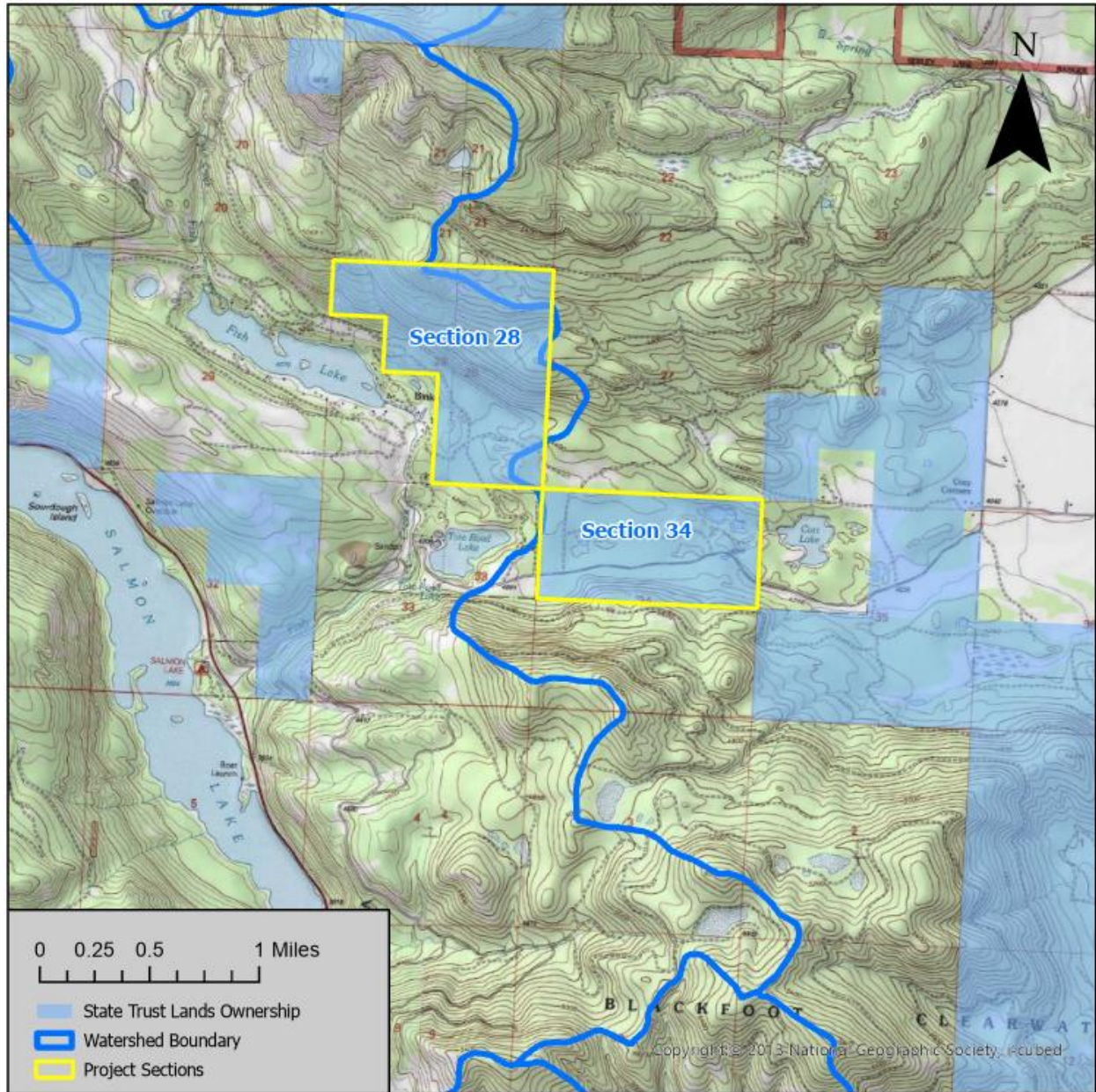
Riparian resources within the harvest areas include isolated ponds and wetlands (isolated and adjacent to the ponds). The largest surface water within the project area is a chain of ponds located in the northeast corner of Section 34. This feature does not carry fish.

A Class 2 or 3 stream initiates near the northeastern corner of Section 28 and does not have perennial flow. If present, this feature will have the necessary equipment and harvest buffers required in SMZ law and rules. A draw runs through the northwestern corner of Section 28 and outside proposed harvest areas – a stream may be present but was not verified for this analysis because proposed activities will not occur at or near this feature.

Big Sky Lake (aka Fish Lake) is located approximately 1,100 feet from the nearest proposed harvest area which exceeds the SMZ and RMZ setback requirements for harvest and equipment operations. The haul route will maintain an even greater distance from the lake.

Cott Lake is located approximately 300 feet east of the nearest proposed harvest area which also exceeds the SMZ and RMZ setback requirements for harvest and equipment operations.

Tote Road Lake (aka Emerald Lake) is located approximately 800 feet from the nearest proposed harvest area and adjacent to the main haul route on county-maintained Woodworth Road. The distance between the project area and the lake exceeds the SMZ and RMZ setback requirements for harvest and equipment operations.



None of the water resources located within or adjacent to the project area are listed as impaired.

The grazing assessment referenced in the previous section noted excellent ground cover and no observed riparian grazing damage within the project area.

Some larger water features located downstream of the project area are listed as impaired, specifically Salmon Lake, the Clearwater River and Cottonwood Creek.

Cottonwood Creek is located approximately 2.5 miles east and downstream of the proposed harvest areas and is listed as impaired due to sedimentation, temperature, and flow regime modification. Sources of these impairments include agriculture, loss of riparian habitat, rangeland grazing, silviculture activities and water diversions. The proposed project is not expected to worsen or improve conditions in Cottonwood Creek for reasons including the 2.5-mile distance, the lack of direct surface flow tributary connection between the project area and Cottonwood Creek, and the relatively small proportion of the watershed of Cottonwood Creek that would be affected by the harvest.

Salmon Lake is located approximately 1.5 miles west and downstream of the proposed harvest areas and has been listed as impaired due to nutrients, siltation, organic enrichment/low dissolved oxygen. Temperature has also been noted as an impairment. Suppression of fish numbers in the lake are attributed to the illegal introduction of northern pike (2006 DEQ assessment). The proposed project is not expected to have the potential to worsen or improve conditions in Salmon Lake for reasons including the geographic distance and the relatively small proportion of the watershed of Salmon Lake that would be affected by the harvest.

Water Quality & Quantity	Impact												Can Impact Be Mitigated?	Comment Number
	Direct				Secondary				Cumulative					
	No	Low	Mod	High	No	Low	Mod	High	No	Low	Mod	High		
No-Action														
Water Quality	X				X				X					1
Water Quantity	X				X				X					1
Action														
Water Quality		X				X				X			Y	2, 3
Water Quantity		X				X				X			Y	2, 3

Comments:

WQ-1: Under the no-action alternative, no timber harvesting or related activities would occur. Water quality conditions would likely continue under its current condition. Similarly, no risk of change of current fluctuations in annual water yield or stream flow would result.

WQ-2: Applicable state plans, rules, and practices have guided project planning and would be implemented during project activities, including the Montana Code Annotated (specifically Title 77, Chapter 5), the Administrative Rules of Montana (specifically Rule Chapter 36.11), the Montana Forest Best Management Practices, and the State Forest Land Management Plan.

WQ-3: Changes to local surface hydrology (water quantity or water flow), or water balance in lakes, are not expected to be detectable or significant with the action alternative. This conclusion is based on the following project and watershed characteristics:

- a. The proposed harvest would remove vegetation from the local watersheds that would, in the short-term (i.e., 0-5 years), locally reduce precipitation interception and evapotranspiration. The proposed harvests are low to moderate intensity, meaning a significant proportion of the existing vegetation would remain. The affected area within the Big Sky Lake (aka Fish Lake) watershed is less than 10%, and the affected area within the Cott Lake watershed is 14%. The hydrologic effect of the proposed

harvests would likely have no detectable effect in the nearby surface waters [Big Sky Lake (aka Fish Lake) and Cott Lake]. Studies correlating vegetation harvest and treatment with streamflow yield have suggested approximately 15-20% of the watershed vegetation must be harvested to have a measurable increase in water yield in similar mountain environments (Stednick, 1996; and Bosch and Hewlett, 1982).

Water Quality & Quantity Mitigations:

No additional project-specific mitigations necessary beyond the project design and commitments listed earlier in this analysis.

Water Resources References:

Bosch, J.M. and J.D. Hewlett. 1982. A review of catchment experiments to determine the effect of vegetation changes on water yield and evapotranspiration. J. Hydrology, 55: 3-23.

Stednick, J.D. 1996. Monitoring the effects of timber harvest on annual water yield. J. Hydrology 176:79-95.

FISHERIES:

Fisheries Existing Conditions:

Fisheries populations are present in the following waterbodies adjacent to the proposed project area. Big Sky and Emerald lakes are both privately managed fisheries.

- Big Sky (Fish) Lake: Westslope cutthroat trout and Rainbow trout
- Fish Creek: Westslope cutthroat trout and Rainbow trout
- Tote Road (Emerald) Lake: Not been surveyed by MFWP or DNRC due to lack of access, multiple non-native species likely present based on personal communication with MFWP

Based on the proposed Action Alternative, no foreseeable direct, indirect, or cumulative effects to fisheries resources are anticipated with an action or no-action alternative due to the following factors:

- No proposed Introduction, Removal, or Suppression of native or non-native species would occur
- No known fish passage barriers are present on DNRC ownership in the project area
- No riparian timber harvest is proposed as a part of the Action Alternative
- Proposed timber harvest units are greater than 500 feet from any known fish-bearing waterbody
- Proposed timber haul route intersects a single fish-bearing waterbody on private land downstream from DNRC ownership, which is maintained by Missoula County.

Fisheries Mitigations:

No additional project-specific mitigations necessary beyond the project design and the mitigations listed in the Water Resources analysis.

WILDLIFE:

Wildlife Existing Conditions: The project area is a mix of forested Douglas-fir, Douglas-fir/western larch, and ponderosa pine stands. Grizzly bears likely use the vicinity of the project area. There are roughly 23 acres of suitable Canada lynx habitats in the project area, which includes 14 acres of winter foraging habitats and 9 acres of 'other suitable' habitats. Portions of the project area are within the home ranges associated with the Salmon Outlet and Salmon Lake Upper bald eagle territories. Potential habitat exists for fisher, flammulated owls, and pileated woodpeckers in the project area. Big game summer range and white-tailed deer, mule deer, and elk winter range exists in the project area, but big game security habitats do not exist in the project area.

No-Action: No potential for disturbance to wildlife would be anticipated. No timber management activities would be conducted, thus no appreciable changes to existing habitats would occur. Continued maturation could improve grizzly bear, Canada lynx, fisher, pileated woodpecker habitats, and big game winter and summer range attributes, but could reduce habitat quality for flammulated owls and big game forage attributes over the long term. Generally, negligible direct, indirect, or cumulative effects to wildlife would occur.

Action Alternative (see Wildlife table below):

In general, habitats for those species adapted to more-open forest conditions similar to areas that historically experienced low-intensity, under burns would increase in the project area. No changes in legal motorized public access would occur in the project area. Contract stipulations would minimize the presence of human-related attractants for the duration of the proposed activities.

Wildlife	Impact												Can Impact be Mitigated?	Comment Number
	Direct				Secondary				Cumulative					
	No	Low	Mod	High	No	Low	Mod	High	No	Low	Mod	High		
Threatened and Endangered Species														
Grizzly bear (Ursus arctos) Habitat: Recovery areas, security from human activity		X				X				X			Y	W-1
Canada lynx (Felix lynx) Habitat: Subalpine fir habitat types, dense sapling, old forest, deep snow zone		X				X				X			Y	W-2

Wildlife	Impact												Can Impact be Mitigated?	Comment Number
	Direct				Secondary				Cumulative					
	No	Low	Mod	High	No	Low	Mod	High	No	Low	Mod	High		
Yellow-Billed Cuckoo (<i>Coccyzus americanus</i>) Habitat: Deciduous forest stands of 25 acres or more with dense understories and in Montana these areas are generally found in large river bottoms	X				X				X					
Sensitive Species														
Bald eagle (<i>Haliaeetus leucocephalus</i>) Habitat: Late-successional forest within 1 mile of open water		X				X				X			Y	W-4
Black-backed woodpecker (<i>Picoides arcticus</i>) Habitat: Mature to old burned or beetle-infested forest	X				X				X					W-3
Common loon (<i>Gavia immer</i>) Habitat: Cold mountain lakes, nest in emergent vegetation	X				X				X					W-3
Fisher (<i>Martes pennanti</i>) Habitat: Dense mature to old forest less than 6,000 feet in elevation and riparian		X				X				X				W-5
Flammulated owl (<i>Otus flammeolus</i>) Habitat: Late-successional ponderosa pine and Douglas-fir forest	X				X				X				Y	W-6
Fringed myotis (<i>Myotis thysanodes</i>)		X				X				X			Y	W-7

Wildlife	Impact												Can Impact be Mitigated?	Comment Number
	Direct				Secondary				Cumulative					
	No	Low	Mod	High	No	Low	Mod	High	No	Low	Mod	High		
Habitat: low elevation ponderosa pine, Douglas-fir and riparian forest with diverse roost sites including outcrops, caves, mines														
Hoary bat <i>(Lasiurus cinereus)</i> Habitat: coniferous and deciduous forests and roost on foliage in trees, under bark, in snags, bridges		X				X				X			Y	W-8
Peregrine falcon <i>(Falco peregrinus)</i> Habitat: Cliff features near open foraging areas and/or wetlands	X				X				X					W-3
Pileated woodpecker <i>(Dryocopus pileatus)</i> Habitat: Late-successional ponderosa pine and larch-fir forest		X				X				X			Y	W-9
Townsend's big-eared bat <i>(Plecotus townsendii)</i> Habitat: Caves, caverns, old mines	X				X				X					W-3
Wolverine <i>(Gulo gulo)</i> Habitat: Alpine tundra and high-elevation boreal forests that maintain deep persistent snow into late spring		X				X				X			Y	W-10
Big Game Species														
Elk	X				X				X				Y	W-11
Whitetail	X				X				X				Y	W-11
Mule Deer	X				X				X				Y	W-11
Bighorn Sheep	X				X				X					W-3

Comments:

W-1: The project area is in 'occupied' grizzly bear habitat as mapped by grizzly bear researchers and managers to address increased sightings and encounters of grizzly bears in habitats outside of recovery zones (Wittinger et al. 2002). The project area is 4 miles south of the Northern Continental Divide Ecosystem grizzly bear recovery zone. Individual animals likely use the project area throughout the non-denning period, and they could be displaced by project-related disturbance if they are in the area during proposed activities. The project area contains several open roads and exists in close proximity to numerous human residences and other forms of human disturbance. Extensive use by grizzly bears would not be expected. Given their large home range sizes, existing human disturbance levels in the area, and manner in which they use a broad range of forested and non-forested habitats, the proposed activities in the project area would have negligible influence on grizzly bears.

W-2: There are roughly 23 acres of suitable Canada lynx habitats in the project area, which includes 14 acres of winter foraging habitats and 9 acres of 'other suitable' habitats. One of these stands is along the northern edge of section 28 and the other is on the southern edge of section 34; Canada lynx habitats in the project area are disconnected and exist in a matrix of non-suitable habitats. The project area is in DNRC's Seeley Lake Lynx Management Area (LMA) and is covered by DNRC's Habitat Conservation Plan (HCP). Across this area, a variety of potential lynx types exist on both DNRC-managed lands (47% of total area) and other ownerships (49% of total area), but are intermixed with non-suitable habitats (53% on DNRC; 51% non-DNRC-managed lands) in portions of both of those areas. Connectivity between potentially suitable habitats in the vicinity is limited due to the percentage of unsuitable habitats in the vicinity and a host of human developments. The majority of the proposed activities would not occur in mapped Canada lynx habitats, and no effects would be anticipated from those activities. Proposed activities would occur on approximately 13 acres of winter foraging habitats (100%) and 9 acres of 'other suitable' habitats. Activities in mapped lynx habitats would retain at least 40% total canopy closure so they would continue to be considered suitable for lynx. However, these stands would continue to be small, isolated patches that exist in a matrix of non-suitable lynx habitats; no appreciable changes in use by Canada lynx would be anticipated. The retention of patches of advanced regeneration of shade-tolerant trees in foraging habitats (in section 34) would break-up sight distances, provide horizontal cover, and provide forest structural attributes preferred by snowshoe hares and lynx. Coarse woody debris would be retained (emphasizing retention of some logs 15 inches DBH and larger) to provide some horizontal cover and security structure for lynx. Proposed activities would not appreciably alter forested connectivity in the vicinity given the matrix of habitats in the vicinity. Similarly, the proposed pre-commercial thinning would largely not be expected to affect Canada lynx habitats since the majority occur in non-lynx habitats; proposed pre-commercial thinning in Canada lynx habitats would alter stand densities, but similar to commercial activities, following all proposed activities, total canopy closure would exceed 40% so that they would continue to be considered suitable for lynx. Proposed activities would convert 14 acres of winter foraging habitats to 'other suitable' habitats following proposed treatments. Within proposed pre-commercial thinning units in lynx habitats, small shade tolerant trees (such as sub-alpine fir and spruce) would be retained where possible to provide potential habitat structure for snowshoe hares by increasing the levels of horizontal cover and accelerating the development of multi-storied stands. Furthermore,

DNRC is committed to retaining 20% of potential thinning units in lynx habitats un-thinned to provide some areas of denser stocking that would provide higher quality habitat for snowshoe hares and thus foraging habitats for lynx; roughly 2 acres of dense saplings would be retained un-thinned in the lynx types. Proposed habitat modifications would be additive to the effects associated with past timber harvesting in the cumulative-effects analysis area as well as any ongoing harvesting. The modifications to existing habitats would alter the mix of habitats in the cumulative effects analysis area, but given the anticipated changes, the nature of habitats in the cumulative effects analysis area, and anticipated levels of use by Canada lynx, negligible cumulative effects would be anticipated with the proposed activities. Roughly 80% of the total potential lynx habitats on HCP-covered lands in the LMA is in the various suitable habitat classes and 20% is in the temporary non-suitable habitat category, largely due to the Jocko Lakes fire of 2007. DNRC-managed lands in the LMA are dominated by winter foraging habitats (43%), followed by other suitable (33%), with lesser amounts of summer foraging habitats (4%). Following proposed treatments, 80% of the LMA covered by the HCP would be in the various classes of suitable lynx habitats.

W-3: The project area is either out of the range of the normal distribution for this species or suitable habitat is not present. Thus, no direct, indirect, or cumulative effects would be anticipated.

W-4: Portions of the project area are within the home ranges associated with the Salmon Outlet and Salmon Lake Upper bald eagle territories. Proposed activities could occur during the early nesting season (February 1 – March 31), late nesting season (June 16-August 15), or the non-nesting season (August 16-February 1). Furthermore, activities could occur within 100 feet of the open roads during the middle of the nesting season (April 1 – June 15); no activities would be conducted away from the open roads between April 1 and June 15. The combination of distance and topography would likely limit any potential for disturbance or displacement of bald eagles should any activities be conducted during the nesting period. Conversely, should activities be conducted during the non-nesting period, no disturbance to bald eagles would be anticipated. No changes in the availability of large snags or emergent trees that could be used as nest or perch trees could occur in the home range.

W-5: Roughly 251 acres of potential upland fisher habitats exist in the project area. Generally, habitats in the project area and the cumulative effects analysis area are somewhat disconnected and of lower quality. Human disturbance, developments, and ongoing timber management in the vicinity have likely limited fisher use of the project area. Proposed activities could introduce more, short-duration disturbance in the upland habitats. Alterations to 214 acres of potential upland habitats would occur, but activities would avoid riparian habitats commonly used by fisher. Proposed treatments in upland habitats would reduce canopy closure and resultant stands would likely be too open to be used by fisher. No changes in open roads would be anticipated; trapping pressure and the potential for fisher mortality would not change. Proposed pre-commercial thinning and planting in fisher habitats (on 512 acres of commercial activities plus an additional 16 acres of fisher habitats and 14 acres of preferred cover types that are currently lacking structural attributes for use by fisher) would improve future fisher habitats by decreasing the time until those stands provide structural attributes needed by fisher.

Reductions in upland habitats would further reduce the amount of suitable upland fisher habitats in the cumulative effects analysis area.

W-6: Roughly 729 acres of potential flammulated owl habitats exist in the project area in dry Douglas-fir, Douglas-fir/western larch, and ponderosa pine stands. Snags are somewhat limited in the project area due to past timber management. Similarly, the cumulative effects analysis area is largely suitable for flammulated owls. Portions of the cumulative effects analysis area have been harvested in the recent past, potentially improving flammulated owl habitat by creating foraging areas and reversing a portion of the Douglas-fir encroachment and opening up stands of ponderosa pine; however, retention of large ponderosa pine and/or Douglas-fir was not necessarily a consideration in some of these harvest units, thereby minimizing the benefits to flammulated owls. Flammulated owls can be tolerant of human disturbance (McCallum 1994), however the elevated disturbance levels associated with proposed activities could negatively affect flammulated owls should activities occur when flammulated owls are present. Proposed activities would avoid the early portion of the nesting season but could overlap the later portions of the nesting period as well as the fledgling period. Since some snags would be retained, loss of nest trees would be expected to be minimal. Proposed activities in potential flammulated owl habitats (481 acres commercial harvesting and another 96 acres of pre-commercial thinning in potential habitats outside of commercial units) would open the stands and improve foraging habitats. The more open stand conditions, the retention of fire adapted tree species, and the maintenance of snags would move the project area toward historical conditions, which is preferred flammulated owl habitat.

W-7: Fringed Myotis are year-round residents of Montana that use a variety of habitats, including deserts, shrublands, sagebrush-grasslands, and forested habitats. They overwinter in caves, mines, crevices, or human structures. Fringed myotis forage near the ground or near vegetation. No known caves, mines, crevices, or other structures used for roosting occur in the project area or immediate vicinity. Fringed myotis have not been documented in the vicinity of the project area. Proposed activities could disturb fringed myotis should they be in the area. Changes in vegetation structural attributes could change overall prey availability, but considerable foraging habitats would persist in the project area and cumulative effects analysis areas. Overall, no appreciable changes to fringed myotis use of the project area or cumulative effects analysis areas would be anticipated.

W-8: Hoary bats are summer residents (June-September) across a variety of forested habitats in Montana. Hoary bats frequently forage over water sources near forested habitats. Hoary bats are generally thought to roost alone, primarily in trees, but will also use caves, other nests and human structures. Some use by Hoary bats would be possible given the varied habitats in the project area and the proximity to the Clearwater River, Big Sky Lake (aka Fish Lake), Tote Road Lake (aka Emerald Lake), and numerous other smaller wetlands. Individual trees and snags in the existing forested habitats could be used for roosting. No known caves or other structures used for roosting occur in the project area or immediate vicinity. Hoary bats have not been documented in the vicinity of the project area. Proposed activities could disturb hoary bats should they be in the area. Loss of potential roosting habitats could occur, but considerable amounts of trees would persist in the project and cumulative effects analysis areas. No changes

in foraging habitats would be anticipated. Overall, no appreciable changes to Hoary bat use of the project area or cumulative effects analysis areas would be anticipated.

W-9: Roughly 415 acres of pileated woodpecker nesting habitat exist in the project area; another 306 acres of potential foraging habitats exist in the project area. Past timber management in the project area has reduced large-diameter trees and snags, reducing habitat potential for pileated woodpeckers. Disturbance to pileated woodpeckers could occur if proposed activities occur during the nesting period, but activities would not occur between April 1 and June 15, thereby limiting some of the potential early nesting season disturbance. Harvesting would reduce forested habitats for pileated woodpeckers in the project area. Roughly 371 acres of potential pileated woodpecker nesting habitats and another 140 acres of potential foraging habitats would be opened up with proposed treatments. These areas would likely be too open to be considered pileated woodpecker habitats following proposed treatments, but some potential continued use as foraging habitats could be possible depending on density of trees retained. Elements of the forest structure important for nesting pileated woodpeckers, including snags, coarse woody debris, numerous leave trees, and snag recruits would be retained in the proposed harvest areas. No appreciable changes to pileated woodpecker habitats would be anticipated with the proposed pre-commercial thinning and planting activities. Since pileated woodpecker density is positively correlated with the amount of dead and/or dying wood in a stand (McClelland 1979), pileated woodpecker densities in the project area would be expected to be reduced on 512 acres. In the cumulative effects analysis area, the reduction in quality on 371 acres of potential nesting habitats and 140 acres of foraging habitats would further reduce available habitats and reduce the overall quality of the cumulative effects analysis area for pileated woodpeckers. Overall, a reduction in the quality of pileated woodpecker habitats in the cumulative effects analysis area would be anticipated, but continued use would be expected.

W-10: Generally, wolverines are found in sparsely inhabited remote areas near tree line characterized by cool to cold temperatures year-round and rather deep and persistent snow well into the spring (Copeland et al. 2010). The availability and distribution of food is likely the primary factor in the large home range sizes of wolverines (Banci 1994). The project area is generally below the elevations where wolverines tend to be located. Some relatively small areas of potentially deep persistent spring snow could occur adjacent to the project area. Individual animals could occasionally use lands in the project area while dispersing or possibly foraging, and they could be displaced by project-related disturbance if they are in the area during proposed activities. However, given their large home range sizes (~150 sq. mi. -- Hornocker and Hash 1981) and the manner in which they use a broad range of forested and non-forested habitats, the proposed activities and alterations of forest vegetation on the project area would have negligible influence on wolverines. Thus, minimal direct, indirect or cumulative effects to wolverines would be anticipated.

W-11: White-tailed deer (311 acres, 41%), mule deer (183 acres, 24%), and elk (760 acres, 100%) winter ranges exist in the project area. Proposed activities could occur during the winter or non-winter periods. Some potential for disturbance to wintering big game could occur with any activities that may occur during the winter period. Proposed activities conducted during the

non-winter period would not disturb wintering big game but could disturb big game species using the project area during the non-winter period. However, given the time of the year and the availability of other habitats in the vicinity, the potential effect to big game would be minor. Proposed activities would reduce canopy closure on roughly 246 acres (79%) of white-tailed deer winter range, 118 acres (64%) of mule deer winter range, and 513 acres (68%) of elk winter range. Following proposed activities, the capacity of these stands to intercept snow and provide thermal cover for big game would largely be removed based on the anticipated density of trees to be retained, reducing habitat quality for wintering big game. Proposed activities would not prevent big game movement through the project area appreciably and could stimulate browse production in the proposed units. Overall decreases in hiding cover would be anticipated, but no changes in available security habitats in the project area or cumulative effects analysis area due to the habitats present and the locations of existing roads. Proposed pre-commercial thinning could also increase sight distances while also altering hiding cover. Overall, changes to sight distance and hiding cover would have minor effects to big game vulnerability risk in the project area. No potential big game security habitat exists in the project area and no changes in open roads would occur, thus no changes to big game security habitat would be anticipated. Potential disturbance to wintering big game would be additive in the cumulative effects analysis area to other forms of disturbance, including timber management, numerous open roads, and a variety of human developments. Further reductions in thermal cover and snow intercept would be additive to losses from recent timber management, residential land clearing, and recent wildfires in the cumulative effects analysis area. Continued use of the larger winter ranges would be anticipated at levels similar to present levels following proposed treatments.

Wildlife Mitigations:

- Minimize potential for disturbance to grizzly bears and numerous avian species by restricting activities between April 1 and June 15, except where activities are within 100 feet of an open road.
- A DNRC biologist will be consulted if a threatened or endangered species is encountered to determine if additional mitigations that are consistent with the administrative rules for managing threatened and endangered species (ARM 36.11.428 through 36.11.443) are needed.
- Motorized public access will be restricted at all times on restricted roads that are opened for harvesting activities; signs will be used during active periods and a physical closure (gate, barriers, equipment, etc.) will be used during inactive periods (nights, weekends, etc.). These roads and skid trails would be re-closed to reduce the potential for unauthorized motor vehicle use.
- Snags, snag recruits, and coarse woody debris will be managed according to ARM 36.11.411 through 36.11.413, particularly favoring western larch and ponderosa pine. Clumps of existing snags could be maintained where they exist to offset areas without sufficient snags. Coarse woody debris retention would emphasize retention of downed logs of 15-inch diameter or larger.

- Contractors and purchasers conducting contract operations will be prohibited from carrying firearms while on duty.
- Food, garbage, and other attractants will be stored in a bear-resistant manner.
- Should a raptor nest be identified in or near project activities, activities will cease and a DNRC biologist will be contacted. Site-specific measures will be developed and implemented to protect the nest and birds prior to re-starting activities.
- Retention of patches of advanced regeneration of shade-tolerant trees in mapped Canada lynx habitats would break-up sight distances, provide horizontal cover, and provide forest structural attributes preferred by snowshoe hares and lynx.
- In pre-commercial thinning units, retain small shade tolerant trees (such as sub-alpine fir and spruce) to provide potential habitat structure for snowshoe hares by increasing the levels of horizontal cover and accelerating the development of multi-storied stands.
- Retain a minimum of 2 acres of lynx habitats in the pre-commercial thinning units in the Seeley Lake Lynx Management Area un-thinned to provide denser stands for snowshoe hares, targeting stands with higher existing densities.

Wildlife References:

- Banci, V. 1994. Wolverine. Pp 99-127 in L. F. Ruggiero, K. B. Aubry, S. W. Buskirk, L. J. Lyon, and W. J. Zielinski, editors. The scientific basis for conserving forest carnivores: American marten, fisher, lynx, and wolverine in the western United States. USDA Forest Service Rocky Mountain Forest and Range Experiment Station, General Tech. Report RM-254, Fort Collins, Colorado, USA.
- Copeland, J. P., K.S. McKelvey, K.B. Aubry, A. Landa, J. Persson, R.M. Inman, J. Krebs, E. Lofroth, H. Golden, J.R. Squires, A. Magoun, M.K. Schwartz, J. Wilmot, C.L. Copeland, R.E. Yates, I. Kojola, and R. May. 2010. The bioclimatic envelope of the wolverine (*Gulo gulo*): do climatic constraints limit its geographic distribution? Can. J. Zool. 88: 233-246.
- Hornocker, M. and H. Hash. 1981. Ecology of the wolverine in northwestern Montana. Journal of Wildlife Management 44(3):1286-1301.
- McCallum, D. A. 1994. Review of technical knowledge: flammulated owls. Pages 14-46 in G. D. Hayward and J. Verner, tech eds. Flammulated, boreal, and great gray owls in the United States: a technical conservation assessment. USDA Forest Service Gen. Tech. Rep. RM-253. Fort Collins, Colorado.
- McClelland, B.R. 1979. The pileated woodpecker in forests of the Northern Rocky Mountains. Pages 283-299 in Role of insectivorous birds in forest ecosystems. Academic Press.
- Wittinger, W.T. 2002. Grizzly bear distribution outside of recovery zones. Unpublished memorandum on file at USDA Forest Service, Region 1. Missoula, Montana. 2pp.

AIR QUALITY:

Air Quality	Impact												Can Impact Be Mitigated?	Comment Number
	Direct				Secondary				Cumulative					
	No	Low	Mod	High	No	Low	Mod	High	No	Low	Mod	High		
No-Action														
Smoke	X				X				X					
Dust	X				X				X					
Action														
Smoke		X			X				X				Y	A-1
Dust		X			X				X				Y	A-2

Comments:

A-1: Slash consisting of tree limbs and tops and other vegetative debris would be piled throughout the project area during harvesting. Slash would ultimately be burned after harvesting operations have been completed. Burning would introduce particulate matter into the local airshed, temporarily affecting local air quality. Over 70% of emissions emitted from prescribed burning are less than 2.5 microns (National Ambient Air Quality PM 2.5). High, short term levels of PM 2.5 may be hazardous. Within the typical column of biomass burning, the chemical toxics are: Formaldehyde, Acrolein, Acetaldehyde, 1, 4 Butadiene, and Polycyclic Organic Matter.

The project area is located within Montana Airshed 3B which encompasses portions of Missoula County and Powell County and includes the Seeley Lake and Missoula impact zones. The project area does not lie within either impact zone.

A-2: Dust may be produced by hauling if it occurs during dry periods. Mitigation (i.e. dust abatement) is possible but would likely not be used as hauling would occur on forest roads that are not used for residential purposes and on county roads that would be maintained by the county.

Air Quality Mitigations:

Burning within the project area would be short in duration and would be conducted when conditions favor good to excellent ventilation and smoke dispersion as determined by the Montana Department of Environmental Quality and the Montana/Idaho Airshed Group. The DNRC, as a member of the Montana/Idaho Airshed Group, would burn only on approved days.

ARCHAEOLOGICAL SITES / AESTHETICS / DEMANDS ON ENVIRONMENTAL RESOURCES:

Will Alternative result in potential impacts to:	Impact												Can Impact Be Mitigated?	Comment Number
	Direct				Secondary				Cumulative					
	No	Low	Mod	High	No	Low	Mod	High	No	Low	Mod	High		
No-Action														
Historical or Archaeological Sites	X				X				X					
Aesthetics		X				X				X			N	AE-1
Demands on Environmental Resources of Land, Water, or Energy	X				X				X					
Action														
Historical or Archaeological Sites	X				X				X					
Aesthetics		X			X				X				Y	AE-1, AE-2
Demands on Environmental Resources of Land, Water, or Energy	X				X				X					

Comments:

AE-1: A Douglas-fir bark beetle outbreak is already impacting portions of the project area. Large patches of red crowns are highly visible from the county road and surrounding hills. Under the no-action alternative, the beetle would continue to spread and vast areas of canopy would turn red on a much larger scale. Under the action alternative, harvest would remove the afflicted trees, producing an immediate visual change by reducing the total canopy, but preventing the spread of beetle to a much larger area.

AE-2: Proposed harvest units in section 28 that would be visible from Big Sky Lake would be prepared given aesthetic concerns.

Mitigations:

- Use topography, openings and other changes on the ground to make harvest and pre-commercial thinning units less visibly obtrusive.
- Varying densities and using “clumpy” spacing reduces the changes to the scenic integrity of the site.

OTHER ENVIRONMENTAL DOCUMENTS PERTINENT TO THE AREA: *List other studies, plans or projects on this tract. Determine cumulative impacts likely to occur as a result of current private, state or federal actions in the analysis area, and from future proposed state actions in the analysis area that are under MEPA review (scoped) or permitting review by any state agency.*

- Kozy Tepee Letter Permit (2011)
- Bandy Poles Letter Permit (2012)

- Tipper's Timber Timber Permit (2009-2010)
- Ashes Timber Timber Permit (2013) & Ashes EA (2013)
- Tote Road Lake Timber Permit (2017-2018)
- Sour Fish Timber Sale (2000-2004) & Sour Fish EIS (1999)
- The State Forest Land Management Plan (DNRC 1996)
- Blackfoot Clearwater Conservation Easement (2004)
- Montana DNRC Forested State Trust Lands Habitat Conservation Plan (HCP)(2010)

No cumulative effects are expected to occur as a result of the past projects on this tract and no other projects are currently proposed in the project area.

Impacts on the Human Population

Evaluation of the impacts on the proposed action including **direct, secondary, and cumulative** impacts on the Human Population.

Will Alternative result in potential impacts to:	Impact												Can Impact Be Mitigated?	Comment Number
	Direct				Secondary				Cumulative					
	No	Low	Mod	High	No	Low	Mod	High	No	Low	Mod	High		
No-Action														
Health and Human Safety		X			X				X					
Industrial, Commercial and Agricultural Activities and Production	X				X				X					
Quantity and Distribution of Employment	X				X				X					
Local Tax Base and Tax Revenues	X				X				X					
Demand for Government Services	X				X				X					
Access To and Quality of Recreational and Wilderness Activities	X				X				X					
Density and Distribution of population and housing	X				X				X					
Social Structures and Mores	X				X				X					
Cultural Uniqueness and Diversity	X				X				X					

Will Alternative result in potential impacts to:	Impact												Can Impact Be Mitigated?	Comment Number
	Direct				Secondary				Cumulative					
	No	Low	Mod	High	No	Low	Mod	High	No	Low	Mod	High		
Action														
Health and Human Safety	X				X				X					
Industrial, Commercial and Agricultural Activities and Production	X				X				X					
Quantity and Distribution of Employment		X				X				X			N/A	H-1
Local Tax Base and Tax Revenues	X				X				X					
Demand for Government Services	X				X				X					
Access To and Quality of Recreational and Wilderness Activities	X				X				X					
Density and Distribution of population and housing	X				X				X					
Social Structures and Mores	X				X				X					
Cultural Uniqueness and Diversity	X				X				X					

Comments:

H-1: According to the Montana Bureau of Business and Economic Research, a general rule of thumb is that for every million board feet of sawtimber harvested in Montana, ten person-years of employment occur in the forest products industry. This harvest is viewed as a continuation of a sustained yield and as such would not create any new jobs but rather sustain approximately 20 person-years of employment in the forest products industry. A few short-term jobs would also be created/sustained by issuing pre-commercial thinning, planting and site-prep contracts following harvest. Additionally, local businesses, such as hotels, grocery stores, and gas stations would likely receive additional revenues from personnel working on the proposed project. This would be a positive impact to quantity and distribution of employment in the area and therefore mitigation would not be necessary.

Mitigations: N/A

Locally Adopted Environmental Plans and Goals: List State, County, City, USFS, BLM, Tribal, and other zoning or management plans, and identify how they would affect this project.

- Blackfoot Clearwater Conservation Easement (DNRC 2004)

Other Appropriate Social and Economic Circumstances:

Costs, revenues and estimates of return are estimates intended for relative comparison of alternatives. They are not intended to be used as absolute estimates of return. The estimated stumpage is based on comparable sales analysis. This method compares recent sales to find a market value for stumpage. These sales have similar species, quality, average diameter, product mix, terrain, date of sale, distance from mills, road building and logging systems, terms of sale, or anything that could affect a buyer's willingness to pay.

No-Action Alternative – Direct, Indirect, and Cumulative Effects: The no-action alternative would not generate any return to the trust at this time.

Action Alternative – Direct, Indirect, and Cumulative Effects: The timber harvest would generate additional revenue for the Pine Hills School Trust. The estimated return to the trust for the proposed harvest is \$256,000 based on an estimated harvest of two million board feet (12,800 tons) and an overall stumpage value of \$20 per ton. Forest improvement fees will also be collected at a rate of \$24.25 per thousand board feet which would generate an estimated \$48,500 to be put towards forest improvements projects. Costs, revenues, and estimates of return are estimates intended for relative comparison of alternatives, they are not intended to be used as absolute estimates of return.

References

DNRC 1996. State forest land management plan: final environmental impact statement (and appendixes). Montana Department of Natural Resources and Conservation, Forest Management Bureau, Missoula, Montana.

DNRC. 2010. Montana Department of Natural Resources and Conservation Forested State Trust Lands Habitat Conservation Plan: Final EIS, Volume II, Forest Management Bureau, Missoula, Montana.

Does the proposed action involve potential risks or adverse effects that are uncertain but extremely harmful if they were to occur?

No.

Does the proposed action have impacts that are individually minor, but cumulatively significant or potentially significant?

No.

Environmental Assessment Checklist Prepared By:

Name: Melissa Laskos
Title: Trust Lands Management Forester
Date: March 22, 2022

Finding

Alternative Selected

After thorough review of the East of Emerald Projects Environmental Assessment (EA), project file, and public scoping, and, all applicable rules and plans, and laws, I have taken the decision to select the Action Alternative.

The Action Alternative meets the intent of the project objectives as stated in *Type and Purpose of Action* listed on page 1 of the EA. Specifically, the proposed project is expected to:

- 1) Contribute the DNRC's annual target of timber harvest volume as mandated by state law (77-5-221 MCA). The predicted project sawlog volume is to be around 2.0 million board feet.
- 2) Will generate revenue for the Trust Beneficiary, Pine Hills School. Estimates are around \$256,000.00 of revenue, with an additional \$48,500.00 for Forest Improvement projects.
- 3) Recently infested stands by Douglas-fir bark beetle would be treated.
- 4) Risk of devastating wildfire within this project (including the Wildland Urban Interface) will be decreased by treating the existing fuel levels, the "fire ladder" that enable crown fires to get started and continue, and a decrease within the stand density.
- 5) Stands will be moved toward the Desired Future Condition (ARM 36.11.405). This will be done using timber harvest (estimates are over 500 acres), pre-commercial thinning (estimates are over 600 acres), and potential planting (estimates are over 70 acres).
- 6) Forest road infrastructure will be improved for future management.

Significance of Potential Impacts

The EA addressed the identifiable potential resource issues through proposed mitigation measures which incorporate all applicable rules, plans, guidelines, and laws.

This approach resulted in a project in which potential effects to several resources were expected to be negligible, minimal, minor, or low. These resources will not be discussed in further detail, specifically:

Standard Vegetative Community – Direct, indirect, and cumulative effects are expected to be low. These effects reflect mitigations and harvest plans designed to benefit forest conditions through promotion of increased stand health and diversity, decreased fuel loading, a probable decrease of Douglas-fir bark beetle spread in the area, and movement towards historic/desired future conditions.

Aesthetics – Direct effects for this project would be low. The planning and layout of harvest units within the viewshed of Big Sky Lake will be prepared using aesthetic concerns as a guide.

Weeds – Direct, indirect, and cumulative effects are expected to be low. However, this doesn't differ from the No-Action Alternative effects. The Action Alternative would provide for more weed spraying than the No-Action Alternative. It also provides mitigations through equipment cleaning and grass seeding.

Soils – Direct, indirect, and cumulative effects are expected to be low. Proposed mitigations along with contract administration are expected to control potential soil disturbance and avoid excessive impacts.

Water Resources – Direct, indirect, and cumulative effects to sediment are expected to be low. Wetlands, small streams, and small ponds are scattered or not included within many of the activities planned.

Fisheries – There is a low risk of short term and low risk of long-term impacts.

Canada Lynx - There is a low risk of direct, indirect, and cumulative effects on Canada Lynx. Portions of this project would be within the Seeley Lake Lynx Management Area (north of the Woodworth Road). Mitigations, found on page 28, will be included to provide denser stands needed by snowshoe hares. These hares are key prey for Canada Lynx.

Wildlife – There is a low risk of adverse direct or indirect effects to big game winter range. However, no long-term effect to winter range carrying capacity or factors that would create long-term displacement or reduced numbers of big game would be anticipated.

Given the expected effects, rationale, mitigations, and overall project benefits, no significant impacts are expected with the selection of the Action Alternative.

Need for Further Environmental Analysis

☐ EIS

☐ More Detailed EA

☒ No Further Analysis

Environmental Assessment Checklist Approved By:

Name: Craig V. Nelson

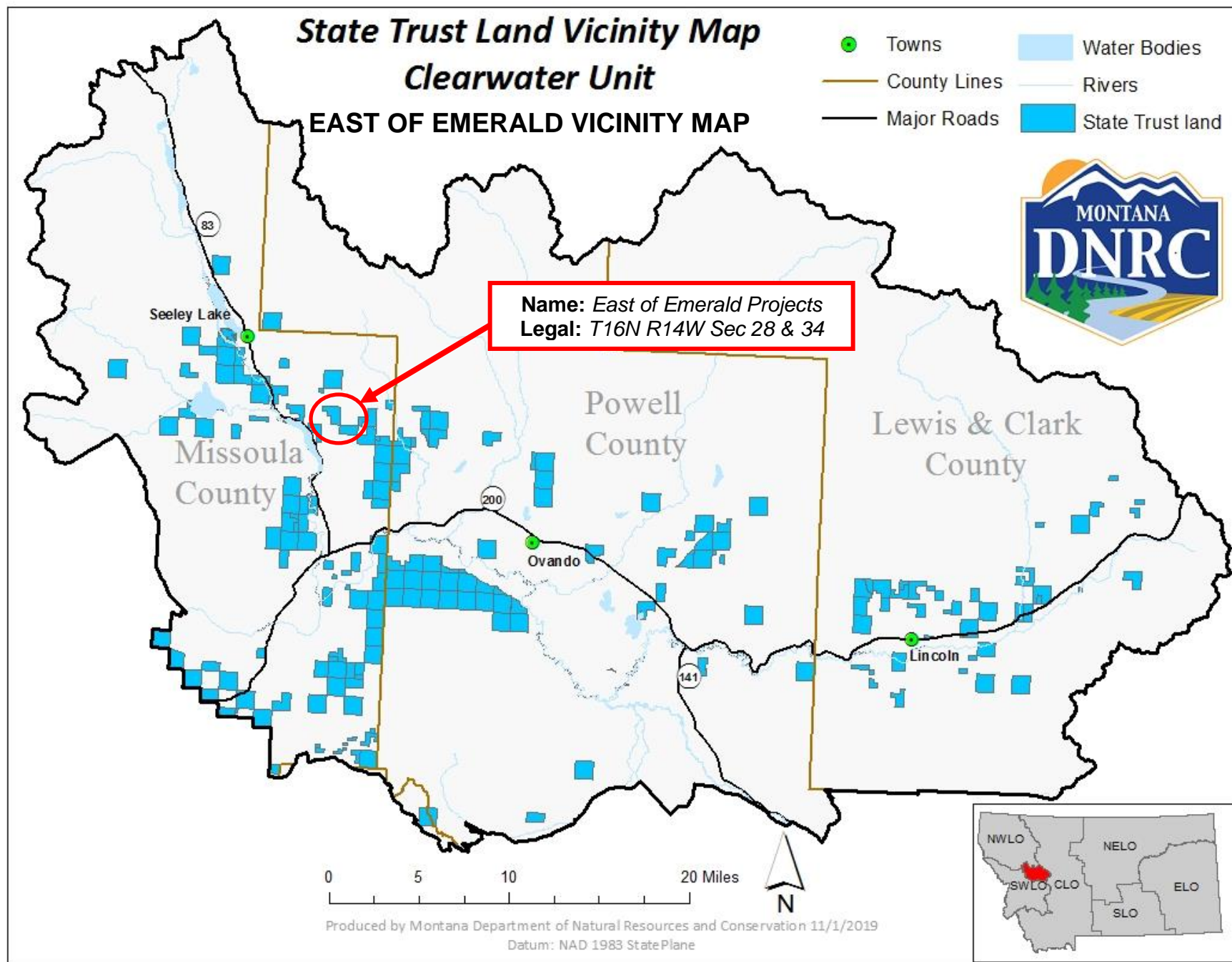
Title: Clearwater Unit Forester Management Supervisor

Date: March 23, 2022

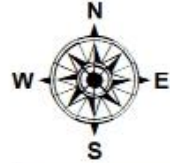
Signature: /s/ Craig V. Nelson

Attachment A - Maps

A-1: Timber Sale Vicinity Map

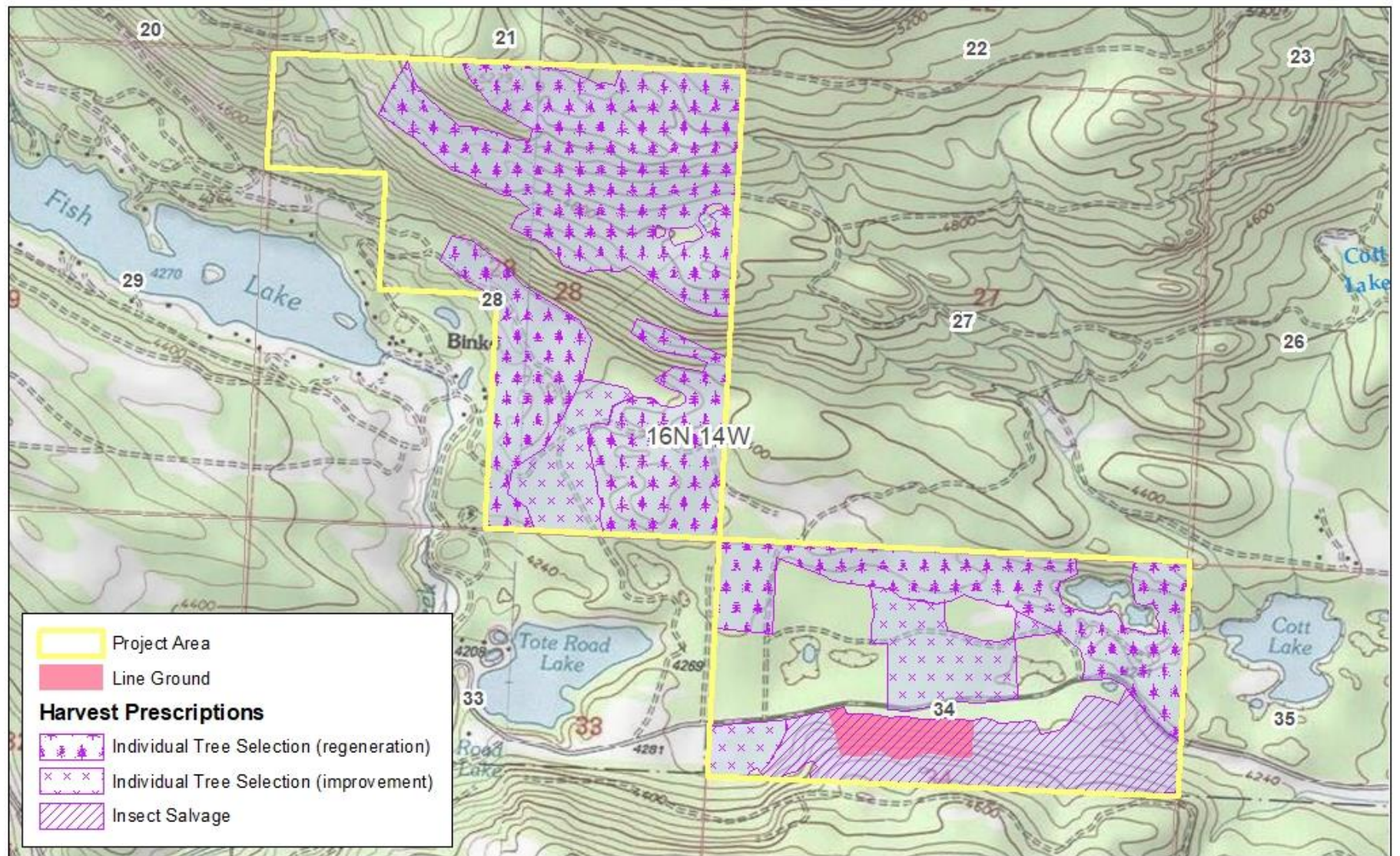


A-2: Timber Sale Harvest Units



East of Emerald Proposed Harvest Prescriptions

Section 28 and 34 T16N R14W



M. Laskos
4/1/2022

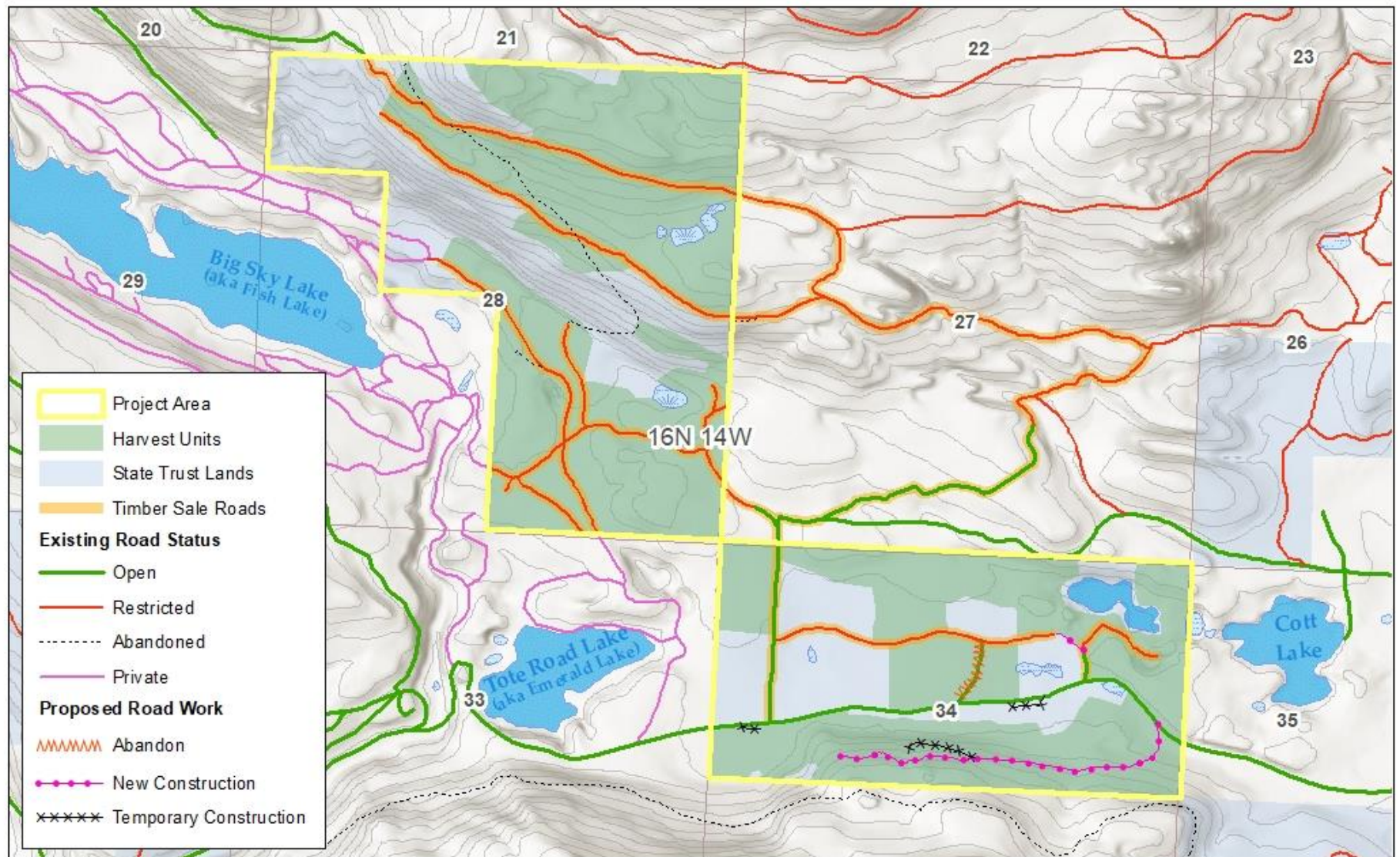
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A-3: Timber Sale Road Plan



East of Emerald Proposed Road Plan

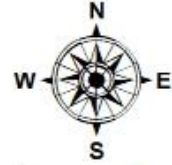
Section 28 and 34 T16N R14W



M. Laskos
4/1/2022

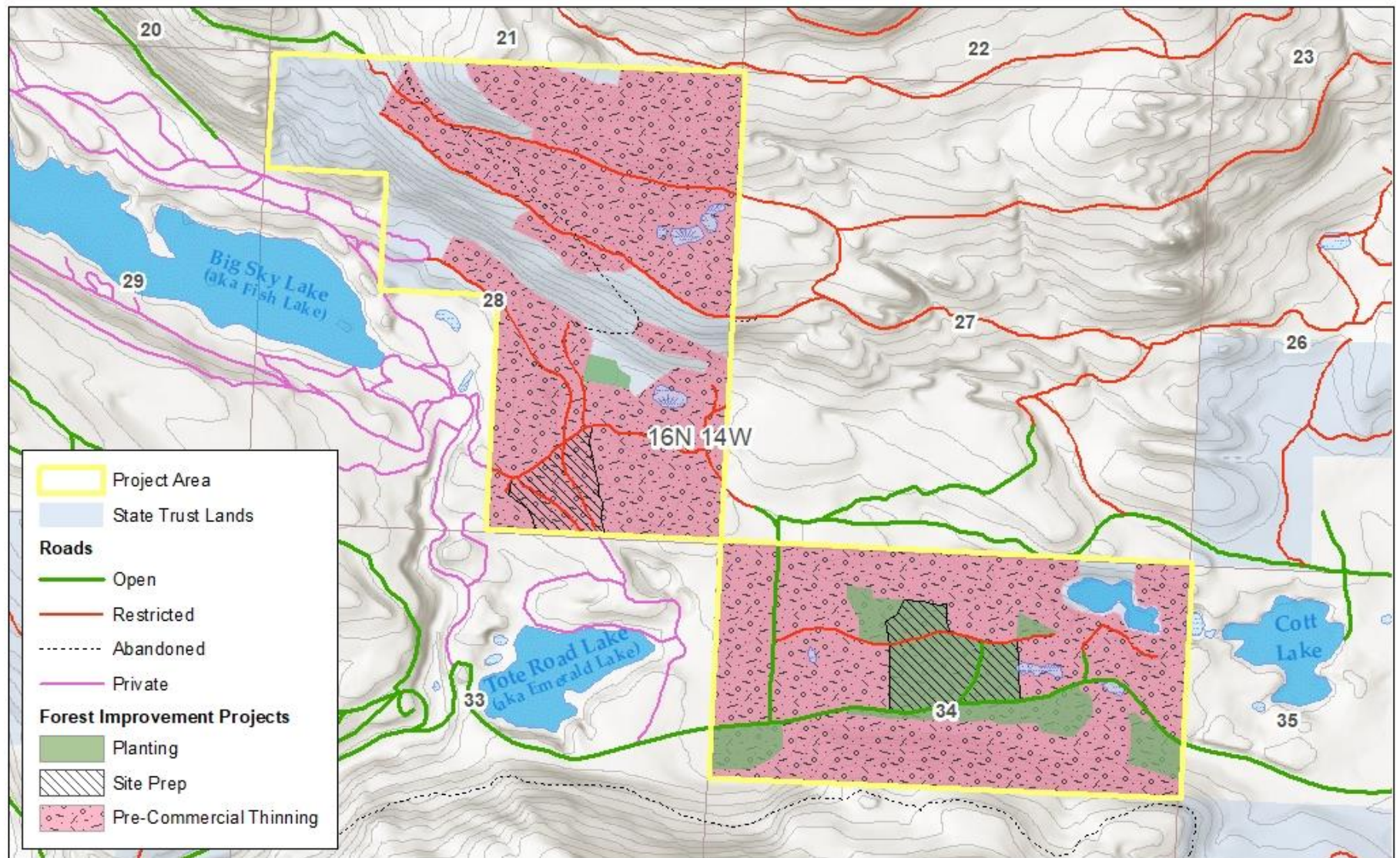
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A-4: Timber Sale Forest Improvement Projects



East of Emerald Proposed Forest Improvement Projects

Section 28 and 34 T16N R14W





**Clearwater Unit
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